JPL

AIRS Validation Overview
&
TDS Support of Validation

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AIRS Science Team Meeting

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Today's Talk

- TLSCF Support of AIRS Validation
  - ***TLSCF (Team Leader Science Computing Facility): the AIRS JPL processing facility***
- Matching AIRS / AMSU / HSB observations to correlative data sets
- First Year Validation Schedules

TLSCF Data Processing

- Level 0: ***Instrument Packets from AIRS/AMSU/HSB***
  - Pushed from GSFC DAAC (EOS processing center) and archived
- Level 1A: ***Instrument Counts***
  - Generate and archive
- Level 1B: ***Calibrated Radiances***
  - Generate and archive
- Level 2: ***Retrieved Geophysical Properties***
  - ***Generate and archive about 10%***

Match these to validation data sets (More later)

TLSCF Data System: TDS

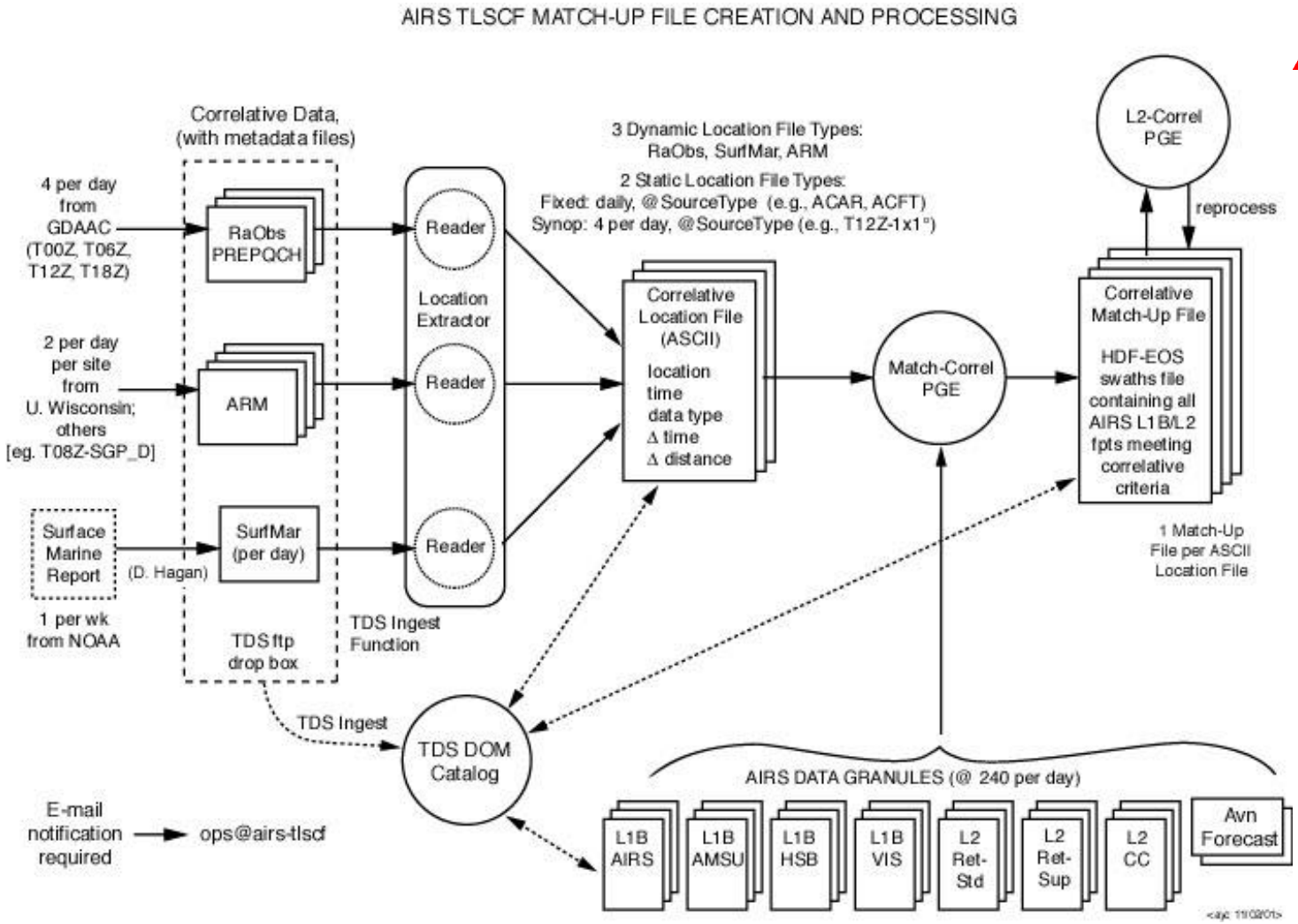
- A data storage system that includes:
  - A data catalog DOM (***Distributed Object Manager)***
  - The DOM Interface
    - GUI and command line driven
    - Reflects directory structure -- masochists can cd
    - Tested recently during AIRS science team exercise
  - Virtual links to or direct copy of files
  - Terabytes of storage
    - 0.5 TB cache
    - 2 TB online for ***TEST*** data sets
    - 25 TB near-line. Enough for a year -- we hope!

Matchups: Key Validation Files

- AIRS / AMSU / HSB instrument footprints ("golfballs") matched to a specified ***time*** and ***location***
  - ***Independent of validation data type***
  - Within specified space-time windows (e. g. 100 km-3 hrs)
  - Contains all AIRS / AMSU / HSB data Levels 1A, 1B & 2
  - Contains pointers to correlative data sets
- Matchup files are archived in the TDS
  - Access is straightforward, with readers available

Matchups involve two data sets --
Correlative data in native format, Matchup files in HDF

Matchup Processing



Post-meeting: Complete this table

PI	Brief Title	Data Type	Data Size of Order…	In TDS Archive?	# Matches	When	Metadata Available?
Atlas	Geophysical Validation …	Assimilation analyses	Really Big	No	N/A	TBD	N/A
Barnes	Validation … Over Mauna Loa	Lidar	Megabytes	Yes	100	L+2 Months	TBD
Bennartz	'Validation of [MW] … at High Latitudes	Microwave radar	Gigabytes?	Limited set	>>100?	Launch?	Probably
McMillan	BBAERI AIRS Ocean…: BAOVE	Radiosondes, AERI, lidar	< Gigabytes	Yes	~100	L+2 Months	TBD
Minnett	Trans-Oceanic Measurements	*Radiosondes, AERI spectra*	< Gigabytes	Yes	~100	TDB by cruises	TBD
Newchurch	Validating AIRS Ozone Observations	Ozonesondes	Megabytes	Yes	~100	L + 2 Months?	TBD
Schmidlin	Temperature, Water Vapor, Ozone Val… Measurements	*Radiosondes, rocketsondes*	Megabytes	Yes	~100	L + 2 Months	TBD
Voemel	'Balloons in upper troposphere	*Radiosondes (good H2O)*	Megabytes	Yes	~100	November to May is bad	TBD
Walden	Validation of…AIRS over the Antarctic Plateau:…	*Radiosondes, AERI spectra, lidar*	< Gigabytes	Yes	~100	Austral Summer 2001-02	TBD
Whiteman	Water Vapor and Cloud w/ Lidars and AERI	Lidar, AERI	< GB?	Yes	~100	L + 2 Months	TBD
Yoe	GPS total water	GPS	< GB	Yes	>>100	Launch	TBD

Accessing TDS and Web Page

- See John Gieselman for passwords
  - Email: jsg@airs1.jpl.nasa.gov; Phone: (818) 354-7848
- Browser or secure remote login (ssh2) for accessing TDS
  - ***JPL computer security trust us only slightly more than universities (foreign national particularly problematical).***
- Use AIRS Science Team Web Page for communication
  - See http://airsteam.jpl.nasa.gov

AIRS/AMSU/HSB First Year Schedule Rollout and Validation

Schedule Drivers

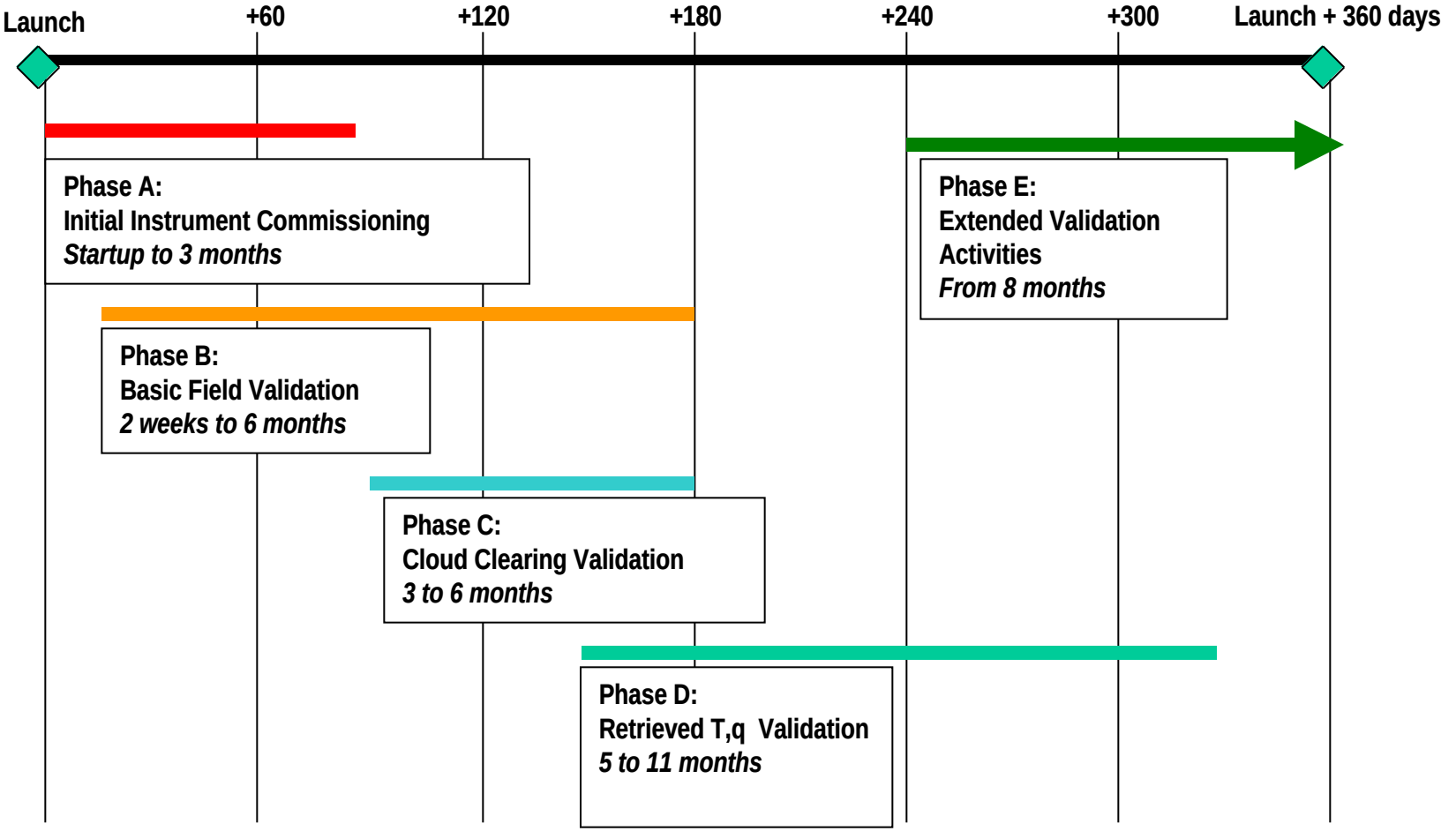
- ***Assess AIRS / AMSU / HSB performance 1 year after launch for handover of processing to GSFC DAAC***
- Other validation schedule drivers include
  - Instrument activation and spacecraft maneuver schedule
  - Data assimilation impact assessment by first year
- Conceptually, validation activities phased by a sequence of stages
  - Initial instrument activation and commissioning
    - Alignment and geolocation
    - Calibration activities
    - Initial assessment of performance
  - Basic field validation
    - Initiate observations at ground truth sites
    - Assess AIRS radiometric performance compared to SST
    - Assess clear sky detection methods

Drivers and Phasing

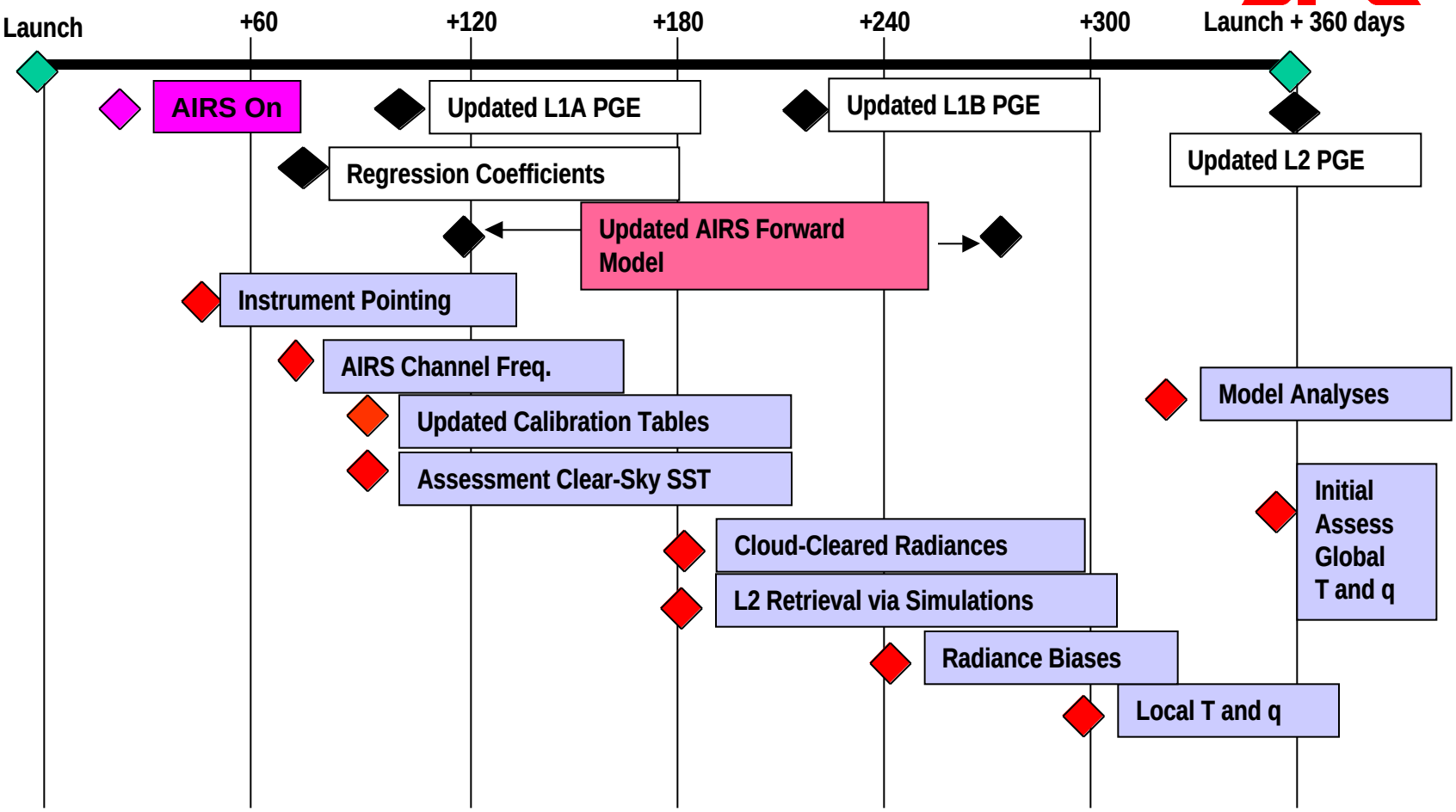
(Phasing continued)

- **Cloud-clearing validation**
  - **From clear ocean scenes assess cloud-cleared radiances**
  - **Clear sky ground truth for forward model assessment**
- **Retrieved T,q validation**
  - **Step 1: local T,q comparisons at well instrumented sites under well characterized conditions**
  - **Step 2: global performance assessment from RaObs and model analyses**
- **Extended validation activities**
  - **Detailed analyses and evaluations using other data sources to continue after initial assessment at Launch + 1 year**
  - **Validation data acquired after Launch + 8 months will not have impact on initial assessment to be completed at Launch + 12 months - this is aimed to declare data products ready for scientific community and labeled as *at least* ScienceQAFlag = "Provisional"**
  - **Later validation will be factored into Launch + 2 year PGE update and data reprocessing with transition of all data products to ScienceQAFlag = "Validated"**

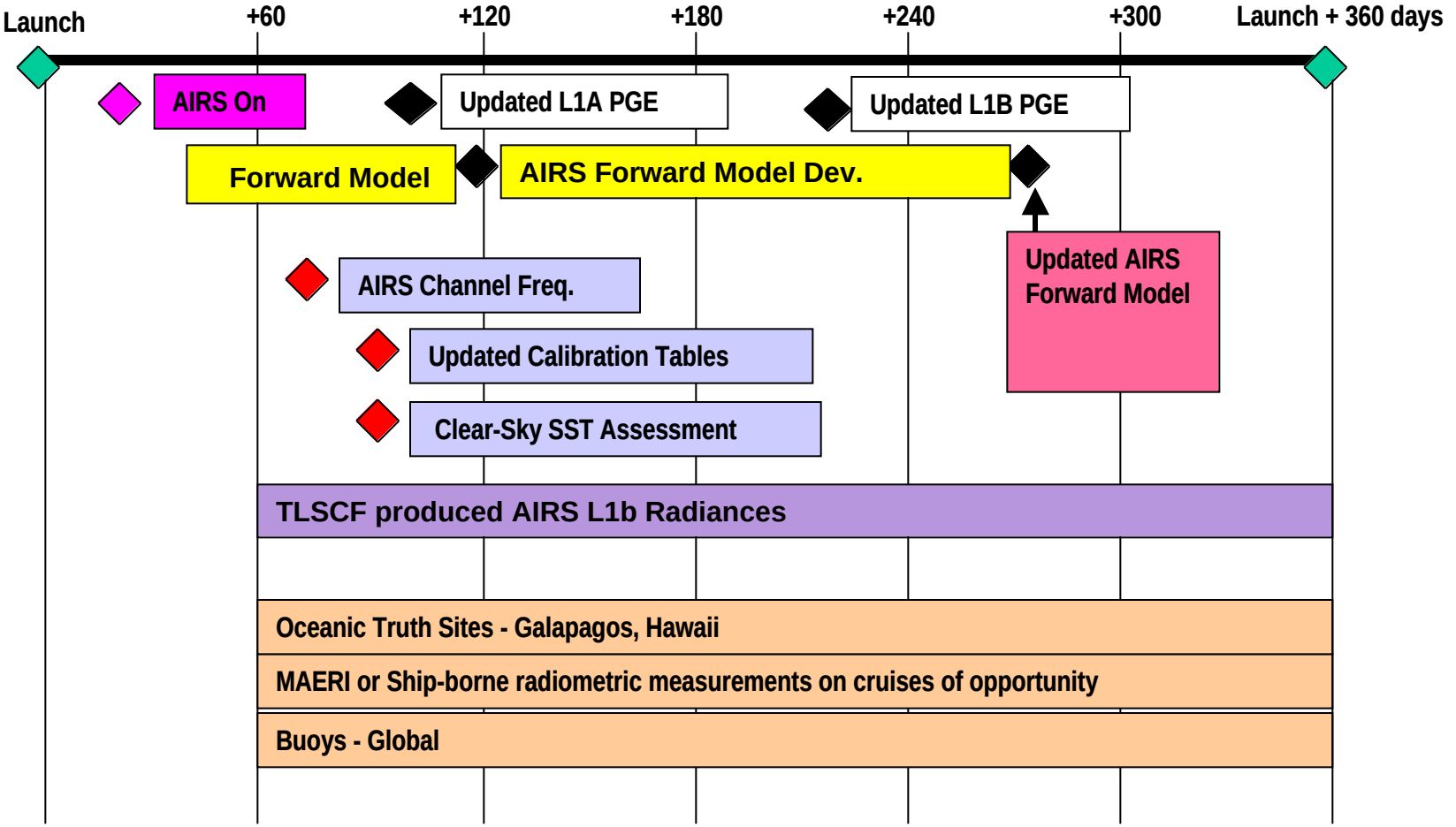
AIRS/AMSU/HSB Early Validation Timeline
Characterizing the atmospheric column and surface observed by AIRS/AMSU/HSB



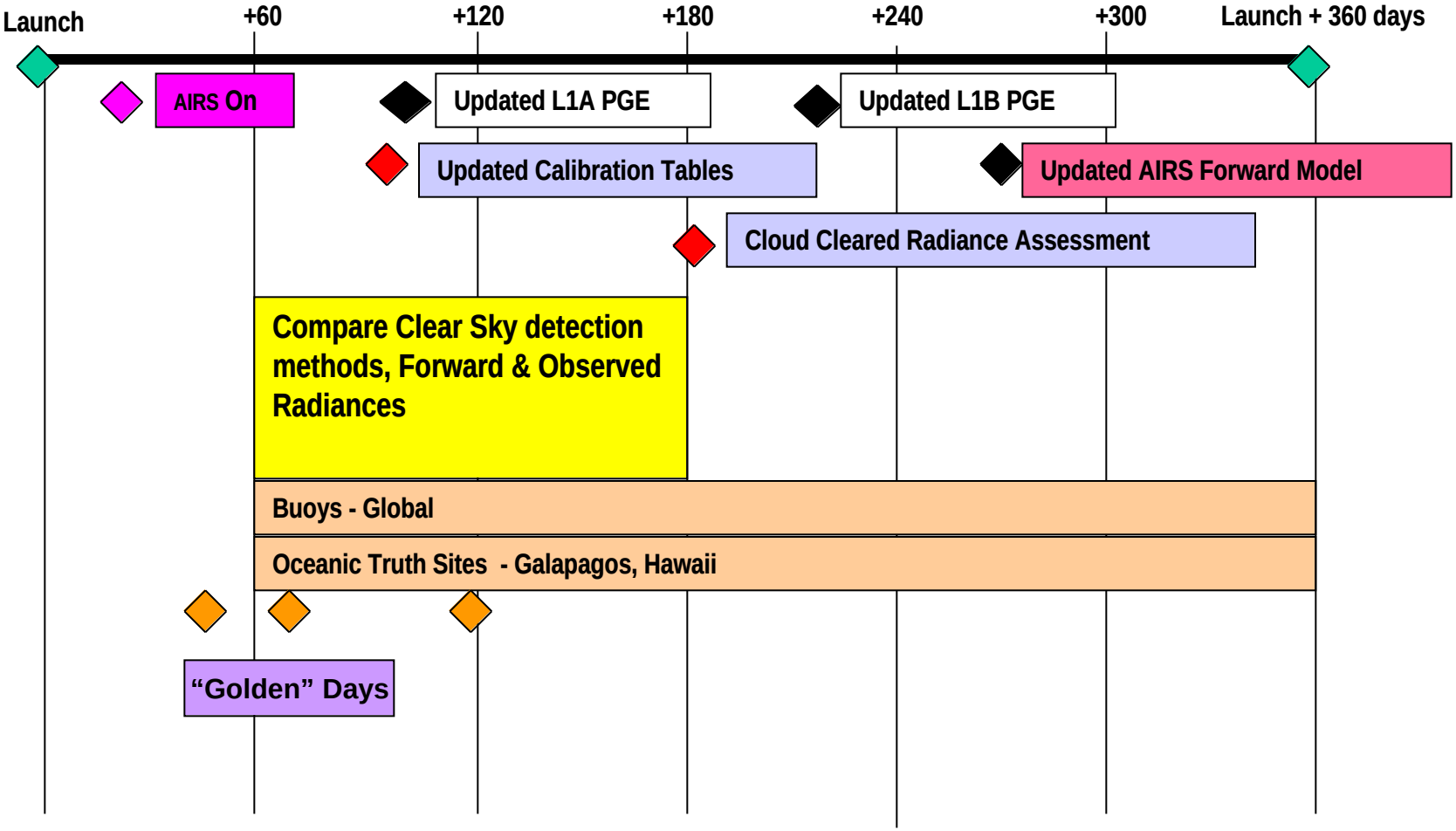
AIRS/AMSU/HSB
Early Validation Schedule and First Year PGE Deliveries



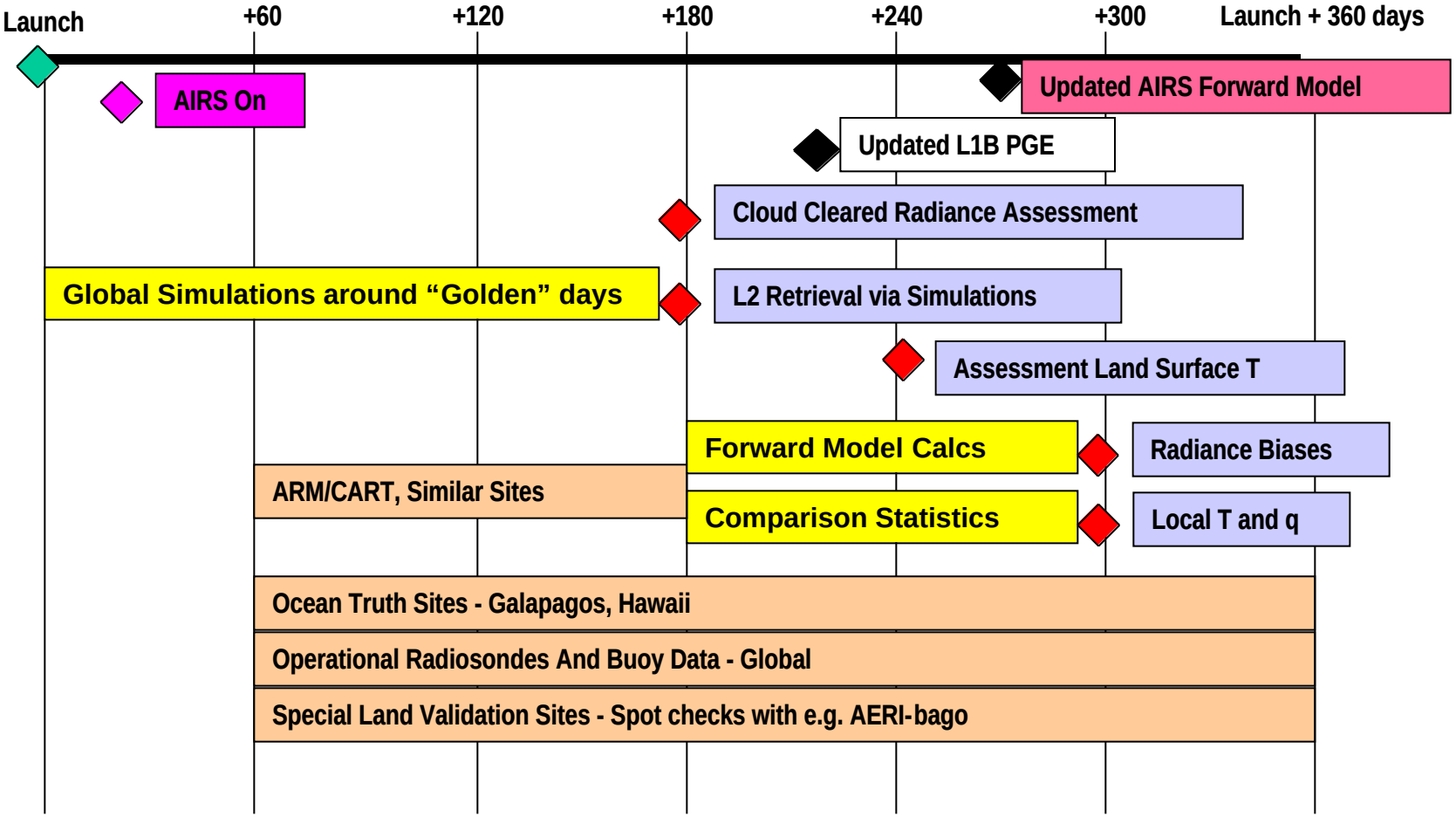
AIRS Calibration, and L1B - SST Validation



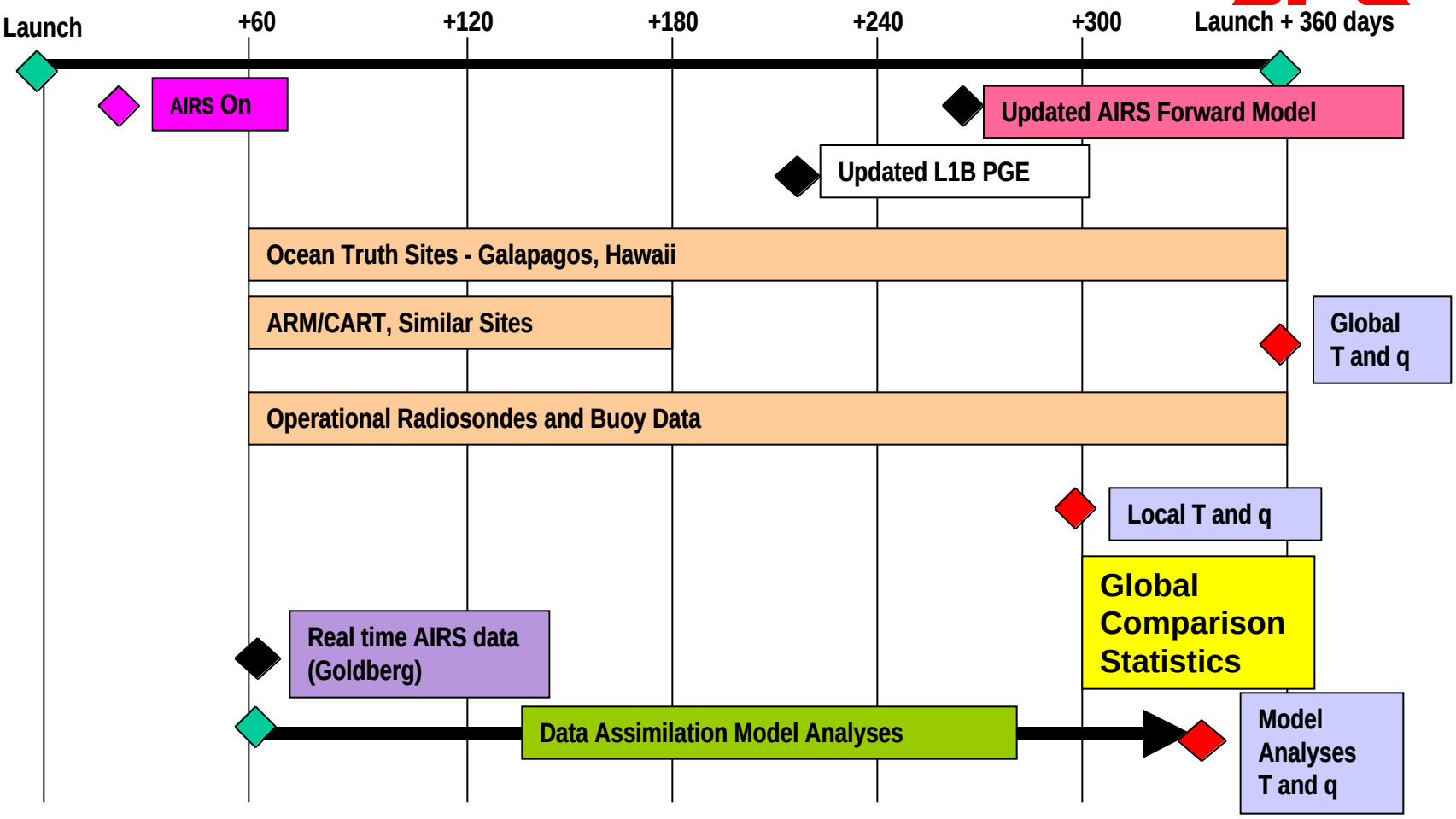
Cloud-Cleared Radiance Validation



Accuracy of Local T and q



Global T and q -- 1 K/1 km and 20% Humidity



Near Term Goals

- Update schedules to include individual investigators' activities
  - Understand schedule constraints to best utilize resources
- Understand correlative data sets to create matchups with AIRS/AMSU/HSB
  - Format, content, readers, metadata…
- Provide further support to validation investigators
  - E. g. Overpass prediction
    - Try http://earthobservatory.nasa.gov/MissionControl/overpass.html